

REMARKS

Claims 2-5, 7-12, 14 and 41-43 are pending herein. Independent claims 1 and 13 have been canceled and the remaining dependent claims have been made dependent on the sole remaining independent claim, claim 41.

1. Claims 1-10 and 41-43 were rejected under §102(b) over Yamata et al. ('392). This rejection is respectfully traversed for the following reasons.

As stated in the amendment filed January 18, 2006, the claimed invention is drawn to a ceramic article comprising a substrate and a corrosion resistant coating provided thereon. The substrate consists essentially of alumina and the coating comprises mainly a rare earth oxide, particularly, at least 80 wt.% rare earth oxide. The coating is provided on the substrate so as to directly contact the substrate such that the ceramic article is free of any intervening layers. Claim 41 has been amended to clarify that the ceramic article is free of intervening layers including thermally reacted interlayers. Support for the clarification to claim 41 is found in paragraph 26 of the present specification, which teaches that the ceramic article may be free of various interlayer structures, such as graded alumina-yttria interlayers, composite interlayers, or thermally reacted interlayers that are formed through deposition of a coating followed by thermal treatment at an elevated temperature to form a reaction product. Accordingly, (i) the recitation of direct contact with the substrate, and (ii) the express limitation that the ceramic article is free of intervening layers including thermally reacted interlayers, preclude the presence of layers between the corrosion-resistant coating and the substrate.

In addition, the claimed invention recites that the corrosion-resistant coating is strongly adhered to the substrate, quantified in terms of adhesion strength not less than about 20 MPa. Notably, the present invention combines features of direct contact of the coating with a substrate and high adhesion strength. These combined features are achieved through the particular process flows described in connection with the Examples of the present specification, particularly through utilization of a preheating step prior to coating, such as preheating the substrate at a temperature of 300°C.

The claimed invention has been particularly developed to overcome notable disadvantages with interlayers, such as thermally reacted interlayers. In particular, Applicants have discovered that high temperature thermal treatment to form a thermally reacted interlayer is disadvantageous, and may lead to degradation in mechanical properties of the underlying substrate. In addition, non-thermally reacted interlayers, such as graded yttria/alumina interlayers are difficult to process.

Turning to Yamada et al. ('392), this reference is directed to the very prior art over which the present invention was developed. As clearly shown in FIG. 1, Yamada et al. ('392) teach the formation of a reacted interlayer. This reacted interlayer is intended to improve adhesion between the yttria corrosion-resistant layer and the underlying substrate in line with the state-of-the-art discussed above. Clearly, present claim 41 precludes the presence of such a reacted layer, and for that reason alone defines over the teachings of Yamada et al. ('392). Applicants do acknowledge Table 1-4 of Yamada et al., teaching embodiments in which no reacted layer is present. However, Yamada et al. do not teach, suggest, or remotely *enable* achievement of high strength quantified by adhesion strength not less than 20 MPa and a structure free of interlayers. That is, Yamada et al. require an intervening reaction layer in order to produce high adhesion strength.

For at least the foregoing reasons in view of the amendments to claim 41, reconsideration and withdrawal of the §102 rejection over Yamada et al. are respectfully requested.

2. Claims 1-10 were rejected under §102(b) over Otsuki. This rejection is moot in view of the cancellation of claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

3. Claims 1-11, 13, 14, and 41-43 were rejected under §102(e) over Yamada et al. (US '392). This rejection is respectfully traversed for the following reasons.

Yamada et al. ('392) teach formation of a yttria-alumina complex oxide overlying a substrate, the yttria-alumina oxide having a yttria/alumina ratio within a range of 0.2 to 1.0, that is, 17% to 50% yttria. Yamada et al. ('392) relate to the state-of-the-art over which the present invention was developed, which relies upon use of a graded layer for adhesion. This reference nowhere discloses (or even remotely suggests) a corrosion-resistant layer comprising at least 80

wt.% rare earth oxide. The entire disclosure of Yamada et al. ('392) is limited to teaching of a combined yttria-alumina oxide in an attempt to improve peel strength.

For at least the foregoing reasons, Applicants respectfully submit that the claimed invention is not anticipated by Yamada et al. ('392). Accordingly, withdrawal of the §102 rejection over this reference is respectfully requested.

4. Claims 11-14 were rejected under §103 over Yamada et al. ('921) or Yamada et al. ('392). These rejections are deficient for the reasons noted above. The references do not teach, suggest, or even remotely *enable* a ceramic article having the recited substrate and corrosion-resistant coating features, which is free of any intervening layers and which has an adhesion strength not less than about 20 MPa. Accordingly, withdrawal of the §103 rejections over Yamada et al. are respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below.

Applicants do not believe that any additional fees are due, but if the Commissioner believes additional fees are due, the Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

Date

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